In Situ Heating Studies of Sandia Octahedral Molecular Sieve

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Introduction: SOMS-1 is a new octahedral molecular sieve developed at Sandia National Labs for selective removal of Sr^{2+} and its immobilization via phase transformation into a stable perovskite phase [1]. Based on these unique properties, it is an ideal candidate for ^{90}Sr cleanup and sequestration at various DOE waste sites where the ^{90}Sr is located in contaminated plumes and groundwater as mixed wastes. *In situ* dehydration studies were carried out using the as synthesized Na^+ and acid (H^+) exchanged phases. The H-exchanged phase transforms to a mixture of phases including an ilmenite phase whereas the as synthesized Na^+ phase transforms to a cubic perovskite phase at *ca.* 500 °C (**Figure 1**). The structure of new hexagonal ilmenite phase is being studied by single crystal synchrotron X-ray diffraction studies at X3A1 beamline. The mechanism of ion-exchange will be determined via *in situ* ion-exchange studies during the next cycle.

References: [1] M.Nyman, A.Tripathi, J. Parise, R.S. Maxwell, W.T.A Harrison and T.M. Nenoff. (2000) Submitted in Nature

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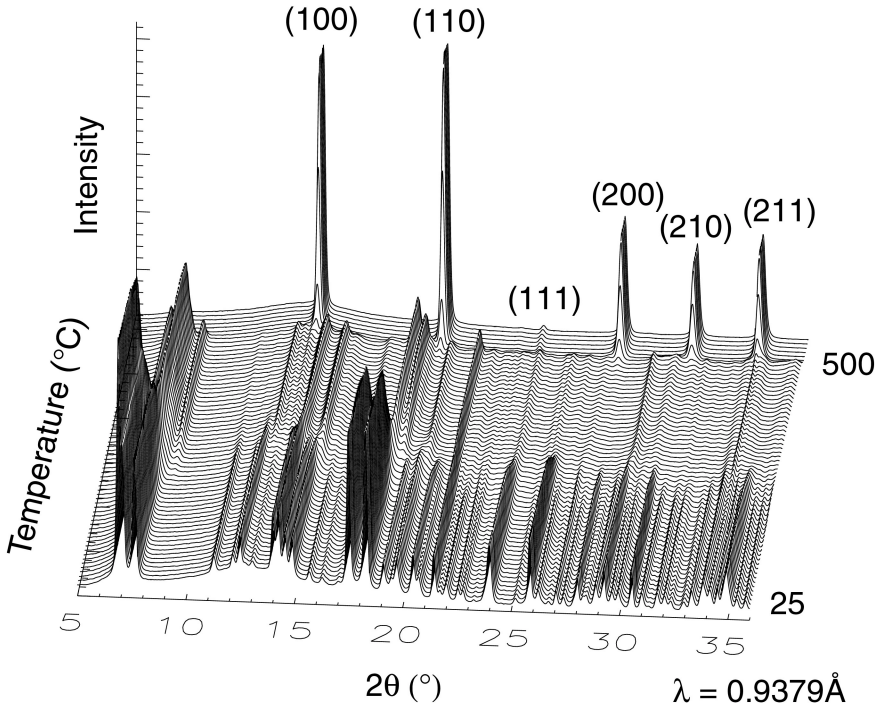

Figure 1. Plot of the synchrotron X-ray powder diffraction profiles as a function of time during the 5-hr. dehydration of Na-SOMS-1